FERO ENGINEERING
ENVIRONMENTAL ENGINEERING & CONSULTING

December 6, 2004

Mr. David Young
Associate Engineering Geologist
Site Cleanup 3 Unit
Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, California 90013

Soil Remediation Progress Report
Continental Heat Treating, Inc.
10643 South Norwalk Boulevard, Santa Fe Springs, California
(SLIC No. 1057)

Dear Mr. Young:

Fero Environmental Engineering, Inc. (Fero) submits this soil remediation progress report for the referenced site on behalf of Continental Heat Treating, Inc (CHT) regarding remediation of near surface subgrade Tetrachloroethylene (PCE) and its degradation byproducts identified in the impacted soils around the former parts cleaning equipment. Fero conducted remediation of the soils using a Vapor Extraction System (VES). A consequence of the remediation technique is that gasoline constituents identified in the soil from a release on an adjacent refinery property were also being remediated at a substantially elevated cost to the client. A system installation and progress report was submitted to the Regional Water Quality Control Board (RWQCB) on May 28, 2004; this report presents progress of the soil remediation from that report to date.

I. BACKGROUND

Environmental Support Technologies, Inc. (EST) conducted a subsurface site investigation at the subject site in March 1997 and they prepared a report, dated May 6 1997 on the investigation titled, *Site Assessment Report, Continental Heat Treating* (Report). The Report described previous investigations conducted at the site by EST and it provided near surface soil sampling data collected by Green Environmental. EST and Green identified chlorinated hydrocarbons consisting primarily of Tetrachloroethylene (PCE) and Trichloroethylene (TCE) from grade to just above the water table proximate to a former degreaser location. The PCE and TCE were detected at maximum soil gas concentrations of 1,948 µg/L and 156 µg/L, respectively near the northeast corner of the former degreaser and the concentrations generally decreased with increased radial distance away from that location. EST collected soil gas samples at 15 locations across the site at up to four depths at each location to a maximum depth of 35 feet. Based on the soil gas results, a boring was conducted to groundwater approximately five feet to the south of the former degreaser. Groundwater was

encountered at approximately 68 feet below grade (fbg). PCE was detected in all of the soil samples collected from 5 to 60 fbg at concentrations ranging from 4.8 to 130 µg/Kg. The soil gas sampling points and soil boring locations are indicated on Figure 1. Fero believed that a sufficient number of soil gas samples and soil matrix samples have been collected at the site to determine the vertical and lateral extent of the organics for remediation purposes.

II. REMEDIATION SYSTEM INSTALLATION AND PROGRESS

In anticipation of conducting vapor extraction at the site, Fero submitted a permit application to the South Coast Air Quality Control Board (SCAQMD) on March 14, 2002. The SCAQMD granted a permit on May 7, 2002.

On January 13, 2004, Fero conducted a test of the 2" well installed by EST to determine whether it would provide sufficient capture efficiency. A 1.74 Hp Siemens blower was connected to the well and operated under a various locations permit with the SCAQMD. The blower discharge was channeled through three carbon canisters before release to the atmosphere. During the test, Fero monitored the vacuum that developed in the probes that remained from the EST investigation. The blower drew a vacuum of 48" water column at the well head indicating that although the formation exhibited a low permeability to air flow, it was amenable to vapor extraction. The highest vacuum achieved at the onsite probes was 2" water column. The initial discharge concentration of volatile organic compounds (VOC) measured at the blower using a Photoionization Detector (PID) was in excess of 2,000 ppm. Fero subsequently connected the EST well to a 2.5 Hp blower and VOC treatment system located at the rear of the building. The vapor extraction system was started on February 23, 2004. Electrical issues related to the high vacuum required of the blower and a supply load restriction caused the blower to trip out after it heated up. This problem was corrected by March 2, 2004 and, except for periods of carbon change-outs, the system operated continuously from that date through September 21, 2004.

Unfortunately, although vacuums developed after the system was started in all of the probes that remained from the EST investigation, Fero was unable to determine the depths of the probes so additional probes were installed on March 1, 2004. Two borings, FP1 & FP2, were conducted to 60 feet below grade (fbg) and five probes were installed in each boring at depths of 5, 15, 30, 45 & 60 fbg. Vacuums were measured in the probes on March 2, 2004 after the system had a chance to equilibrate. Table 1 provides the vacuums measured in the probes.

Consistent with the SCAQMD permit, Fero retained Hydro-Geo Spectrum to monitor the discharge from the second carbon canister and from the stack to verify compliance with the permit requirements once a week for the first four weeks. In addition to the compliance monitoring, a round of initial soil gas concentrations were collected from the new probes on March 16, 2004. The soil gas concentrations are summarized in Table 2.

The permit to operate granted by the SCAQMD, required equipment monitoring with a PID on a daily basis for the first two weeks and then the schedule was to be adjusted depending on the discharge. Fero conducted scheduled vapor sampling at the blower, between the GAC canisters and at the discharge stack using a PID to confirm compliance with the SCAQMD permit daily for two weeks and subsequently on a bi-weekly schedule. The blower had a vacuum of approximately 46" water column which equates to a

-Table 1-
Probe Vacuum
Continental Heat Treating, Inc.
10643 South Norwalk Boulevard, Santa Monica
March 2, 2004

Sample ID	Depth (ft.)	Vacuum (in. H2O)
FP1	5	1.0
	15	1.1
	30	0.8
	45	0.6
	60	0.4
FP2	5	2.5
	15	2.5
	30	2.4
	45	1.7
	60	1.4

ND = not detected at laboratory detection limit.

-Table 2-
Soil Gas Concentrations
Continental Heat Treating, Inc.
10643 South Norwalk Boulevard, Santa Monica
March 16, 2004 & August 6, 2004
(µg/L)

Sample ID	Depth (ft)	Sampling Date	PCE	TCE	1,2-DCE	VC	HC
FP1	5	3/16/04	2,718	157	107	16	6,300
		8/06/04	640	120	32	ND	15
	15	3/16/04	2,351	136	ND	29	7,700
		8/06/04	2,602	251	328	45	738
	30	3/16/04	1,335	43	16	46	7,500
		8/06/04	2,792	422	445	225	4,345
	45	3/16/04	1,517	54	41	57	8,500
		8/06/04	1,831	235	428	217	6,516
	60	3/16/04	934	43	33	63	8,000
		8/06/04	1,441	194	309	331	15,873
FP2	5	3/16/04	154	32	12	11	4,000
		8/06/04	7.7	1.4	ND	ND	ND
	15(eq.)	3/16/04	*3.9*	*ND*	*ND*	*ND*	*23*
		8/06/04	1,881	142	ND	1.4	126
	30	3/16/04	972	80	54	21	12,000
		8/06/04	96	29	57	24	1,226
	45	3/16/04	1,241	48	14	42	8,500
		8/06/04	1,439	159	200	201	9,218
	60	3/16/04	660	49	22	12	12,000
		8/06/04	985	112	84	132	14,888

ND = not detected at laboratory detection limit.

flow of approximately 90 scfm. The vapor extraction system operated continuously except for carbon change outs from March 2, 2004 through September 21, 2004. The initial total VOCs concentration measured at the wellhead using a PID calibrated for iso-butane was in excess of 1200 ppmv. The final VOCs concentration measured on September 21, 2004, was 90 ppmv. A copy of the monitoring log is attached hereto as Exhibit A.

III. DISCUSSION

The data in Table 2 indicate a significant reduction in chlorinated compound concentrations to 30 fbg in FP2 located approximately 10 feet from the extraction well and a significant reduction to 5 fbg in FP1 located approximately 30 feet from the extraction well. The data collected during the sampling dates are not readily comparable in FP2-15' because the first set was an equilibrium sample suggesting the soil was saturated with water during the first sampling. The concentrations of the chlorinated compounds increased in both probe clusters at all other deeper depths indicating a mass of higher concentration vapor moving through the probe locations on the way to the extraction well.

Likewise, the concentrations of gasoline constituents decreased significantly to 45 fbg in FP1 and to 30 fbg in FP2. The concentrations of gasoline hydrocarbons doubled in FP1-60' and increased in FP2-45' & 60'. The increases at depth suggest a significant offsite contribution and possibly a free product layer on the water table.

The vapor extraction system is not operating efficiently for removal of the chlorinated hydrocarbons because of the presence of the high concentrations of, primarily aliphatic hydrocarbons in the soil. The aliphatics are from refined oil, they are more volatile than PCE and they do not adsorb to the soil as well as PCE and so they are extracted from the soil more readily. Fero strongly recommends reevaluation of the extraction process and consideration given to investigating the offsite source for possible recovery for the extra costs of remediating their problem.

Should you have any questions pertaining to this soil remediation progress report, please do not hesitate to contact me at (714) 256-2737.

Respectfully,
Fero Environmental Engineering, Inc.

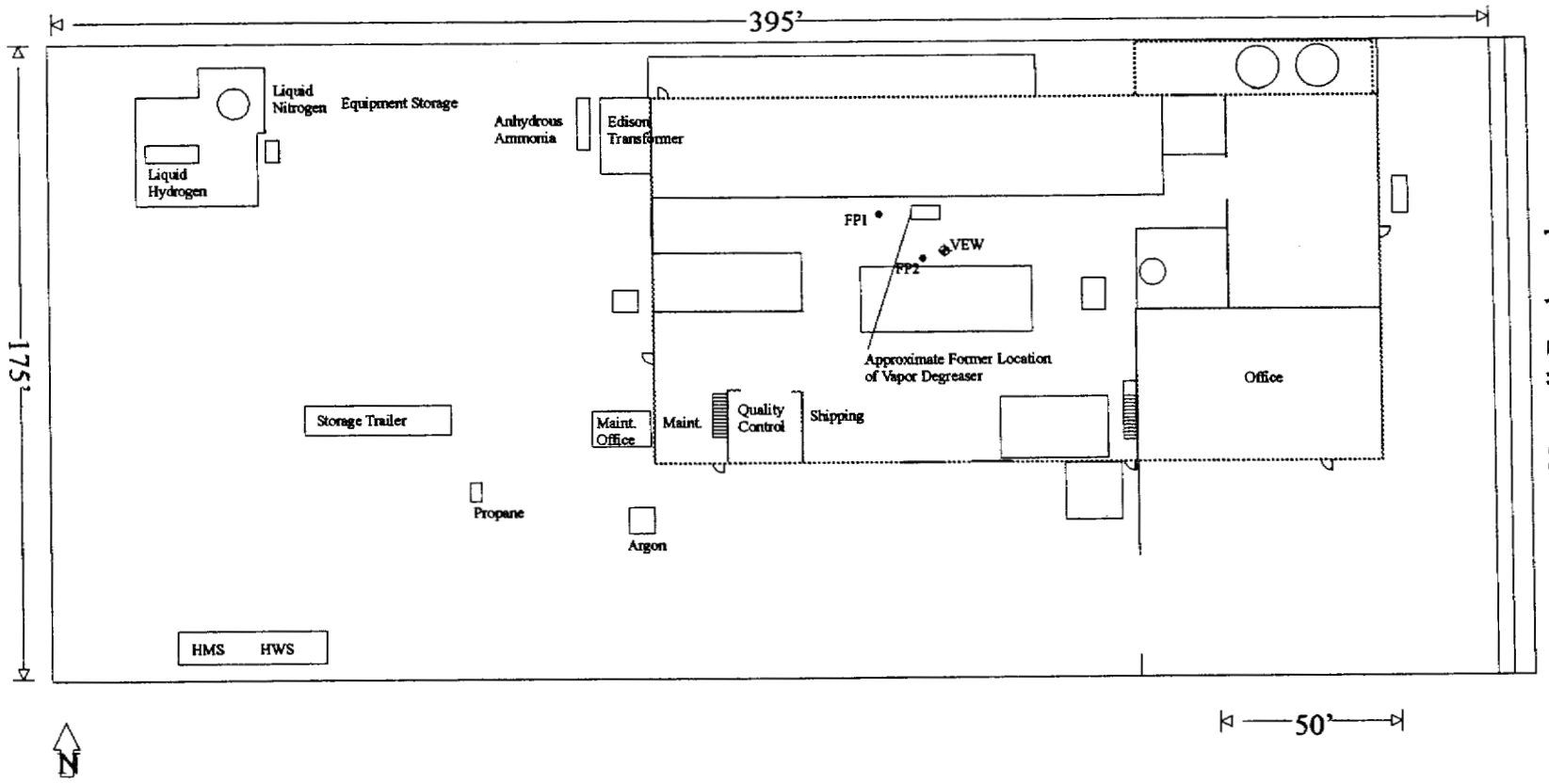
Rick L. Fero, P.E.
President

REGISTERED PROFESSIONAL ENGINEER
RICK L. FERO
No. 43927
Exp. 06/30/05
CIVIL
STATE OF CALIFORNIA

RLF: jbp
[381ProgRpt]

cc: James Stull
Continental Heat Treating

Bob Schneider
Trilogy



Legend

- ❖ - Soil Gas Extraction Well
- • - Soil Gas Sampling Probes

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Well and Probe Locations
Continental Heat Treating, Inc.

10643 South Norwalk Boulevard
Santa Fe Springs, California

Base Map Source: Trilogy Regulatory Services

[381well&probeloc]

Figure 1

EXHIBIT A

Monitoring Log

SOIL VAPOR EXTRACTION SYSTEM

VAPOR TREATMENT FACILITY MONITORING

Continental Heat Treating

10643 S. Norwalk Blvd., Santa Fe Springs

STACK .20

Date	Time	Header Vac. (in. H2O)	Blower Out VOC (ppmv)	Between 1 & 2 VOC (ppmv)	Between 2 & 3 VOC (ppmv)	Stack Out VOC (ppmv)	Temperature (Degs. F)	Comments
2-23-04	2:40	68	>1200	0	0	0		
2-24-04	1:40	68	>1200	0	0	0	150°	Blower was off ①
2-25-04	12:30	50	>1200	0	0	0	130°	Blower off [illegible]
2-26-04	2:33	60	>1200	0	0	0	125°	Blower off
2-27-04	12:16	50	>1200	Ø	Ø	Ø	130°	CHG'D HEATERS
3-1-04	1:05	50	>1200	0	0	0	140°	" " Conf. OBr
3-2-04	11:10	50	>1200	4	0	0		
3-3-04	11:10	50	>1200	32	0	0	154°	
3-5-04	11:45	56	>1200	88	0	0	150	
3-9-04	9:40	54	>1200	82	45	4	158	
3-12-04	8:15	50	>1200	73	59	32		OFF
3-17-04	10:40	52	>1200	10	7.9	0	142	
3-22-04	9:50	50	>1200	75	42	18	144	
3-25-04	2:30	50	>1200	95	82	42	140	OFF
3/26/04	10:00	53	>1200		14.9	Ø		ON *
3/29/04	10:00	50	>1200	84	72	4	152	
4-2-04	12:45	50	—	—	—	38	150	OFF
4-8-04	11:00	52	>1200	13	9	0	130	ON *
4-13-04	10:00	52	>1200	65	50	18	130	
4-16-04	11:30	52	>1200	79	56	37	142	OFF
4-22-04	2:50	56	>1200	11	13	4		[illegible]
4-26-04	10:20	52	>1200	73	48	8	140	
5-?-04	9:50	52	>1200	75	59	46	154	OFF
5-6-04	1:15	46	>1200	83	69	0	150	ON *
5-16-04	11:20	46	129	77	54	28	145	OFF
5-19-04	11:00	46	117	83	72	0	140	ON *
5-24-04	1:45	46	126	95	66	32	148	OFF
6-8-04	1:30	48	105	27	5	0		ON *
6-14-04	12:45	44	112	69	54	28	150	OFF
6-22-04	10:15	46	98	56	30	0	140	ON *
6-25-04	12:30	44	117	53	70	18	152	
6-28-04	11:00	44	99	67	55	26	150	OFF
7-7-04	10:00	44	97	65	52	0	144	ON *
7-14-04	2:00	44	96	96	72	43	150	OFF
7-21-04	—	—	—	—	—	—	—	ON *

Comments: ① OPEN Bleed to 55" H2O

* [illegible]

SOIL VAPOR EXTRACTION SYSTEM

VAPOR TREATMENT FACILITY MONITORING

Continental Heat Treating

10643 S. Norwalk Blvd., Santa Fe Springs

STK 20

Date	Time	Header Vac. (in. H2O)	Blower Out VOC (ppmv)	Between 1 & 2 VOC (ppmv)	Between 2 & 3 VOC (ppmv)	Stack Out VOC (ppmv)	Temperature (Degs. F)	Comments
7-23-04	11:20	44	182	64	21	0	156	
7-28-04	10:30	44	106	82	59	28	144	OFF
8-9-04	11:00	44	112	82	67	~~0~~	154	ON *
8-13-04	9:45	44	100	68	54	22	148	OFF
9-8-04	10:00	43	113	10	4	~~0~~	142	ON *
9-21-04	3:10	44	90	102	72	37	150	OFF

Comments: